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Mazdoor Kisan Shakti Sangathan

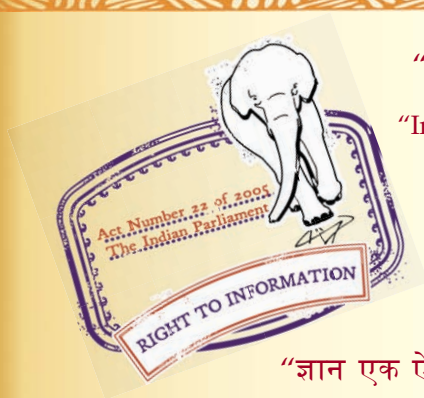
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“पुराने को छोड़ नये के तरफ”

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“Step Out From the Old to the New”

IS 4910-7 (1989): Methods of Test for Tyre Yarns, Cords and Tyre Cord Warpsheets Made from Man-Made Fibres, Part 7: Heat Degradation [TXD 1: Physical Methods of Tests]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

**METHODS OF TEST FOR
TYRE YARNS, CORDS AND TYRE CORD
WARPSHEETS MADE FROM MAN-MADE FIBRES**

PART 7 HEAT DEGRADATION

(First Revision)

भारतीय मानक

कृत्रिम रेशों से निर्मित सूत डोरी और टायर डोरी ताना चढ़ें — परीक्षण पद्धतियाँ

भाग 7 उष्मा अपचयन

(पहला पुनरीक्षण)

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FOREWORD

This Indian Standard (Part 7) (First Revision) was adopted by the Bureau of Indian Standards on 15 July 1989, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

This standard which was first published in 1971 has been revised to incorporate changes on the basis of experience gained during its use.

In the preparation of this standard, due weightage has been given to the testing practices being followed in the country in this field.

This standard forms a part of a series of standards under the title Methods of test for tyre yarns, cords and tyre cord warpsheets made from man-made fibres.

In reporting the results of a test made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

METHODS OF TEST FOR TYRE YARNS, CORDS AND TYRE CORD WARPSHEETS MADE FROM MAN-MADE FIBRES

PART 7 HEAT DEGRADATION

(First Revision)

1 SCOPE

1.1 This standard (Part 7) prescribes methods for determination of degradation in strength of rayon and nylon (polyamide) tyre yarns and cords taken from cheeses, cones, bobbins, spools, hanks, and tyre cord warpsheets after being subjected to elevated temperature.

2 REFERENCE

2.1 The following Indian Standard is a necessary adjunct to this standard :

IS No.	Title
IS 4910 (Part 3) : 1989	Methods of test for tyre yarns, cords and tyre cord warpsheets made from man-made fibres : Part 3 Load and elongation characteristics (first revision).

3 PRINCIPLE

3.1 For Rayon

First, the initial strength of tyre yarn or cord is determined in the oven-dry state. Then the strength of the material is determined after subjecting it to specified elevated temperature for specified time. The loss in strength is determined and expressed as percentage of the initial strength.

3.2 For Nylon (Polyamide)

First, the initial strength of tyre yarn or cord is determined after conditioning it in the standard atmosphere. Then, the strength of the material is determined after subjecting it to specified elevated temperature for specified time and then conditioning it in standard atmosphere. The loss in strength is determined and expressed as a percentage of the initial strength.

4 SAMPLING

4.1 Sample from the lot shall be drawn so as to be representative of the lot. Sample drawn in accordance with the relevant material specification or as agreed to between the buyer and the seller shall be held to be representative of the lot.

5 CONDITIONING OF TEST SPECIMEN

5.1 Unless otherwise agreed to between the buyer and the seller, the test sample shall be conditioned to a state of moisture equilibrium from the dry side in the standard atmosphere at 65 ± 2 percent relative humidity and $27 \pm 2^\circ\text{C}$ temperature. A standard temperature of $20 \pm 2^\circ\text{C}$ may also be used provided it is declared in the test report.

NOTE — When a test sample under zero tension has been left in such a way as to expose, as far as possible, all portions of it to the standard atmosphere for 24 hours, the test sample shall be deemed to have reached a state of moisture equilibrium.

6 ATMOSPHERIC CONDITIONS FOR TESTING

6.1 The test shall be carried out in the standard atmosphere (see 5.1).

7 APPARATUS

7.1 Single Strand Tensile Strength Testing Machine, conforming to 6.1 of IS 4910 (Part 3) : 1989.

7.2 Drying Oven

Drying oven shall be provided with forced ventilation and shall be capable of maintaining temperatures of $105 \pm 3^\circ\text{C}$ and $180 \pm 3^\circ\text{C}$.

8 PROCEDURE

8.1 Take a test sample and make skeins out of it. Divide the sample into 2 sets of specimens and follow the procedure as given in 8.1.1 in case of rayon and 8.1.2 in case of nylon (polyamide) tyre yarns and cords.

8.1.1 Rayon

Place one set of test specimens in the drying oven maintained at $105 \pm 3^\circ\text{C}$ and keep it for 2 hours before testing tensile strength. Place the other set in drying oven maintained at $180 \pm 3^\circ\text{C}$ for 4 hours before testing tensile strength. Determine the strength of both sets of specimens of the test sample separately as given in IS 4910 (Part 3) : 1989.

8.1.2 Nylon (Polyamide)

Condition one set of specimens for 24 hours in standard atmosphere before testing tensile strength. Place the other set of specimens in the drying oven maintained at $180 \pm 3^{\circ}\text{C}$ for 4 hours and then condition it in standard atmosphere for 12 hours before testing tensile strength. Determine the strength of both sets of specimens of the test sample separately as given in IS 4910 (Part 3) : 1989.

8.2 Test another test specimen in a similar manner. Perform at least 10 tests for both sets of test specimens of the test sample.

8.3 Determine the average strength of both sets of the specimens of the test sample separately.

9 CALCULATION

9.1 Calculate the heat degradation of the test sample by the following formula:

Heat degradation, percent

$$= \frac{A - B}{A} \times 100$$

where

- A = initial strength of the first set of specimens of the test sample, and
 B = final strength of the second set of specimens of the test sample after being subjected to heat treatment.

10 REPORT

10.1 The test report shall include the following:

- a) Description of the material tested;
- b) Name of the instrument and capacity;
- c) Mean time for break or rate of traverse;
- d) Number of tests performed:
 - 1) Initial, and
 - 2) After heat treatment;
- e) Strength:
 - 1) Initial strength, and
 - 2) Strength after heat treatment;
- f) Heat degradation, percent; and
- g) Temperature used for conditioning that is $27 \pm 2^{\circ}\text{C}$ or $20 \pm 2^{\circ}\text{C}$.

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Amendments Issued Since Publication

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